

DEPARTMENT OF TRANSPORTATION**Research and Special Programs
Administration****49 CFR Part 173****[Docket No. HM-201; Advance Notice]****Detection and Repair of Cracks, Pits,
Corrosion, Lining Flaws, Thermal
Protection Flaws, and Other Defects of
Tank Car Tanks****AGENCY:** Research and Special Programs
Administration (RSPA), (DOT)**ACTION:** Advanced notice of proposed
rulemaking (ANPRM)

SUMMARY: RSPA and the Federal Railroad Administration (FRA) are considering new safety standards that would require railroad tank car owners and repair facilities to inspect for cracks after certain tank repairs to assure that no cracks exist. RSPA and FRA are also considering the revision of existing periodic reinspection requirements for tank car tanks to more adequately detect cracks, pits, corrosion, lining flaws, thermal protection flaws, and

other defects. These new safety standards and revised periodic reinspection requirements could include specific inspection techniques to assure that small defects, which may grow in size, are properly identified and repaired or monitored.

DATE: Comments must be received by February 11, 1988.

ADDRESS: Address comments to the Dockets Unit, Research and Special Programs Administration, Department of Transportation, Washington, DC 20590. Comments should identify the docket and notice number and be submitted in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard. The Dockets Unit is located in Room 8426 of the Nassif Building, 400 7th Street SW., Washington, DC 20590. Public dockets may be reviewed between the hours of 8:30 a.m. and 5:00 p.m., Monday through Friday, except holidays.

FOR FURTHER INFORMATION CONTACT: Philip Olekszyk, Deputy Associate Administrator for Safety, Federal Railroad Administration, RRS-2, Washington, DC 20590, Telephone 202-366-0897.

SUPPLEMENTARY INFORMATION: As a result of actions taken in response to an incident involving a tank car tank leaking ethylene oxide on December 31, 1984, at North Little Rock, Arkansas, RSPA and FRA have identified a problem concerning tank car tanks with small cracks. Investigation of this incident revealed that the subject tank car tank had been equipped with an anti-shift bracket not in conformance with the Hazardous Materials Regulations (HMR) for such brackets on tanks carrying hazardous materials. FRA's Office of Safety subsequently reviewed construction records and had identified, by September 1985, approximately 9,000 hazardous materials tank car tanks with nonconforming brackets. These tanks were built by one manufacturer, which proposed to bring the affected tanks into conformance by means of a campaign to remove the nonconforming brackets, inspect the tank shell for cracks, and remove or repair detected cracks before returning the tank to service.

During the retrofit program, FRA inspectors noted some anomalies in the procedure. Independently, FRA received reports from the Louisiana State Police of similar anomalies. In August 1985, the FRA's Associate Administrator for Safety asked the DOT Transportation Systems Center to make a preliminary technical assessment of the adequacy of

the manufacturer's inspection and repair procedures. The center formed a Task Force for this purpose, consisting of five senior engineering faculty members from three universities, a National Bureau of Standards expert on tank car steels, and two senior members of the Center's technical staff. The Task Force members are nationally recognized authorities on structures, structural fatigue, and fracture mechanics.

The Task Force issued a final report, which is available as part of this docket. This report documents the Task Force assessment of the inspection and repair procedures. The Task Force assessed three risks: (1) The risk that local reductions of shell thickness ("thin shell") might lead to burst failures, (2) the risk that the inspection procedure would not detect certain cracks which might continue to grow in fatigue during subsequent service, and (3) the risk that a weld repair might damage the shell if the repair procedure is not adequate. The thin shell issue is addressed in a separate notice of proposed rulemaking published elsewhere in today's *Federal Register*. The Task Force has identified two major technical issues, related to crack detection and repair: (1) Adequacy of crack detection and (2) the ability to repair detected cracks without collateral damage.

In addition to the above study, the Task Force has also issued a report, which is part of this docket, concerning the retrofit installation of 'belly stiffeners' under the tank shell of certain tank car tanks. The report indicates that the shell belly should be nondestructively inspected for cracks. The report also indicates that post weld heat treatment, even for those situations in which 49 CFR 173.31(f) does not require postweld heat treatment, would be beneficial in reducing residual stresses which can promote crack initiation and growth.

In addition to the detection and repair of cracks arising from tank repairs, RSPA and FRA are also concerned with the detection and repair of cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects arising from causes other than tank repairs. 49 CFR 173.31(c)(3) generally requires that single unit tank car tanks in service 10 years or more be 'internally inspected' for defects during the periodic retest and reinspection of the tanks. There are no similar requirements for multi-unit tank car tanks, although § 173.31(d)(9) does allow the visual inspection of certain tanks as an alternative to periodic hydrostatic testing.

RSPA and FRA are concerned that the lack of specificity in the internal

inspection requirements of 49 CFR 173.31(c)(3) for single unit tank car tanks and the absence of any internal inspection requirements for multi-unit tank car tanks, may result in the nondetection of small defects that may grow in size and lead to tank failure. RSPA and FRA are also concerned with the detection and repair of defects that are present on the external surface of tank car tanks, but which are obscured by insulation.

RSPA and FRA do not have quantitative data on how many tank car tanks have undetected cracks, pits, corrosion, lining flaws, thermal protection flaws, or other defects. However, we are aware that (1) some insulated tanks have substantial corrosion on the external tank surfaces, apparently due to a reaction between insulation components and condensation, (2) some tanks in corrosive service have large areas where internal corrosion has reduced the tank thickness to below the minimum thickness prescribed in Part 179 of the HMR, and (3) the linings of some tanks have lost their integrity. Therefore, RSPA and FRA believe that there may be a significant number of tank car tanks that are stenciled and used as DOT specification tank car tanks, but are actually noncomplying tank car tanks, because they have defects (such as unrepaired cracks, pits, corrosion, or lining flaws). Accordingly, these noncomplying tanks are not authorized to transport hazardous materials requiring the use of a DOT specification tank.

RSPA and FRA have concluded that rulemaking may be needed to address the detection and repair of cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects. RSPA and FRA request all interested parties to provide comments on the questions listed below:

1. What types of tank car tank repairs are likely to lead to undetected cracks (e.g., grinding, arc gouging, welding)?
2. How effective is postweld heat treatment in reducing the growth of existing cracks or the formation of new cracks?
3. What inspection techniques (e.g., ultrasonic, magnetic particle, acoustic emission, and radioscopic) are appropriate to detect small cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects?
4. What techniques are appropriate to repair small cracks, pits, corrosion, lining flaws, thermal protection flaws, and other defects without causing collateral damage?
5. For small cracks, pits, corrosion, lining flaws, thermal protection flaws,

and other defects, what alternatives to defect repair are appropriate (e.g., special handling, special train placement, and more frequent reinspections)?

Commenters are not limited to responding to the questions raised above and may submit any facts and views consistent with the intent of this notice. In addition, commenters are encouraged to provide comments on "major rule" considerations under the DOT regulatory procedures (44 FR 11034), potential environmental impacts subject to the Environmental Policy Act, information collection burdens which must be reviewed under the Paperwork Reduction Act, and economic impact on small entities subject to the Regulatory Flexibility Act.

Issued in Washington, DC on December 2, 1987 under the authority delegated in 49 CFR Part 106, Appendix A.

Alan I. Roberts,

Director Office of Hazardous Materials Transportation.

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